

A NEW SPECIES OF *XYLOPHAGUS* MEIGEN FROM MEXICO, WITH A
CRITIQUE OF WEBB'S (1979) PHYLOGENY OF THE GENUS
(DIPTERA: XYLOPHAGIDAE)

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Abstract.—*Xylophagus durango*, new species, is described from Durango, Mexico, the first report of the genus from south of the United States. Webb's (1979) phylogenetic treatment of *Xylophagus* is evaluated.

Key Words: Diptera, Xylophagidae, new species, Mexico, phylogeny

The genus *Xylophagus* Meigen is known from the Palaearctic [13 species (Krivoshina and Mamaev 1988)] and Nearctic [7 species (Webb 1979)] Regions. A total of 19 species is known, with one species, *X. cinctus* (De Geer) being Holarctic. The genus has not been previously recorded from south of the United States, with the southernmost localities being in southern California, Mississippi, and Georgia (Webb 1979). The discovery of the new species described here from Durango, Mexico, extends the known range of the genus southward approximately 650 miles (about 1050 kilometers).

Xylophagus durango, NEW SPECIES

Type material.—The holotype male, housed at the Canadian National Collection, Ottawa, is labeled: "MEXICO: Durango 24 Mi. W La Ciudad 7000 feet 12 August 1964 W. R. M. Mason/HOLOTYPE ♂ *Xylophagus durango* N. E. Woodley." The specimen was mounted from alcohol in July 1991 after hardening in ethyl acetate. It is in excellent condition, missing only the tarsus on the right hind leg. The abdomen beyond the seventh segment is macerated and preserved in a microvial with glycerin on the specimen pin.

Diagnosis.—*Xylophagus durango* differs from other species in the genus in having an extremely narrow alula, narrower than the width of the base of vein A_1 . In Webb's (1979) key it runs to couplet 4, which differentiates between *X. lugens* Loew and *X. cinctus* (De Geer). Both of these species have predominantly yellow fore coxae, so *X. durango* can be separated from them immediately because of its dark front coxae. Additionally, *Xylophagus durango* differs from *X. lugens* in having a more slender form, the postsutural lateral margins of the scutum tomentose, and the posterior margin of the katapisternum and the entire meron tomentose. Males of *X. lugens* have more extensive and conspicuous pale yellow coloration on the legs and have the frons and face markedly narrowed from the ocelli to the oral margin. *Xylophagus cinctus* also has predominantly yellow legs in males, especially the coxae and femora.

Description.—*Male:* Coloration black except as noted below. Head (Figs. 1-2) with frontal bare spot and upper face laterally under tomentum yellowish brown; frons and face nearly parallel-sided in anterior view, the inner eye margins converging very slightly toward oral margin, frons 0.26 width

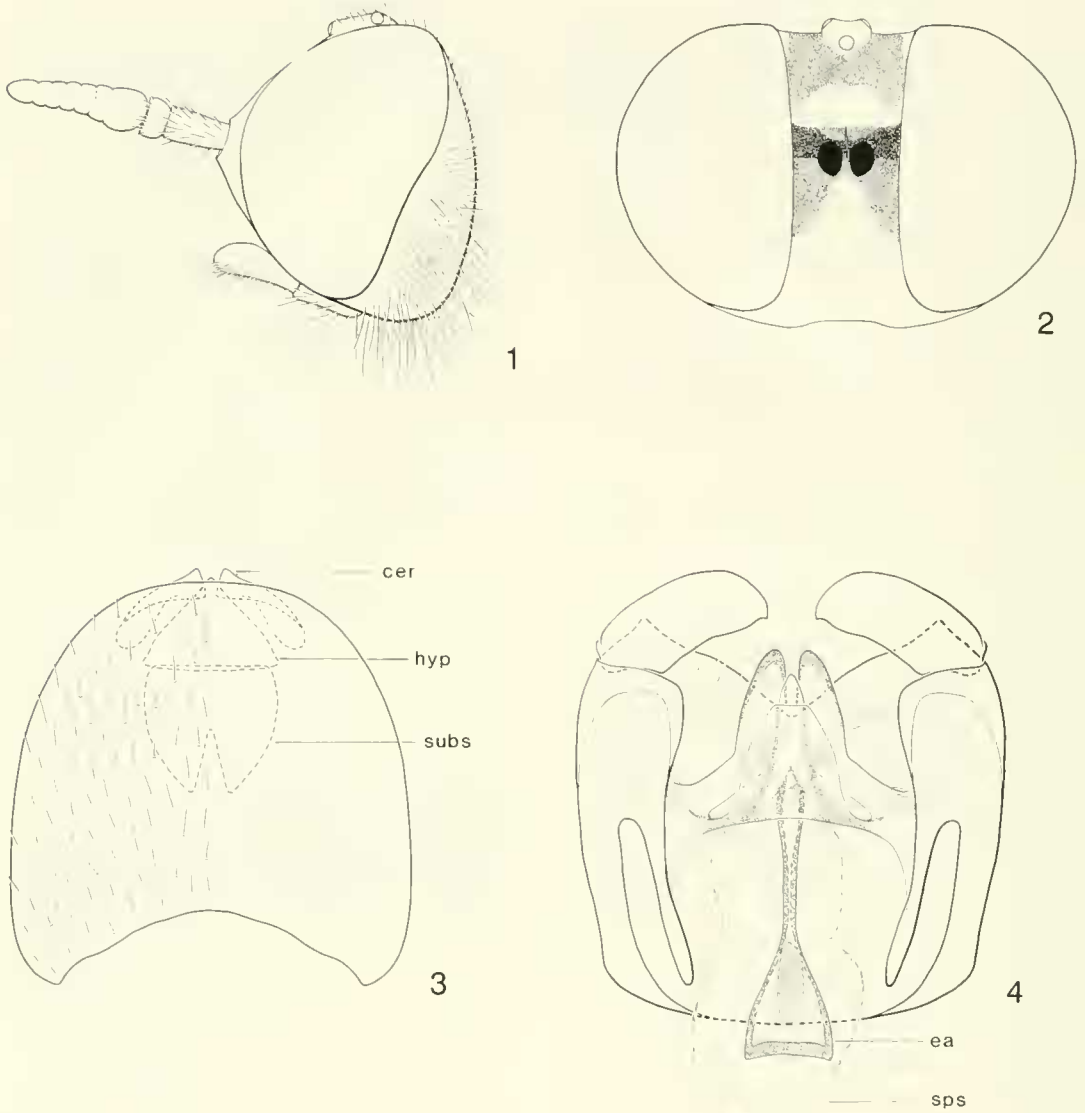
of head at anterior ocellus, fronto-facial region at antennal sockets slightly prominent; upper frons with pale gray tomentum of moderate density, ocellar tubercle subshining, very thin tomentum present along margins of frontal bare spot, dense tomentum present around antennal sockets, vaguely darker lateral to antennae than below, narrowing ventrally on face toward eye margins; occiput with gray tomentum of moderate density, with vertex and narrow, irregular eye margins bare and shiny; vertex, occiput, and genae with whitish pilosity, longest on genae, a few of the hairs near upper eye margins dark; antennae short, 0.87 length of head, ratio of segments (scape: pedicel: [flagellomeres]) 12:5:[7:3:3:3:3:7], scape with length/width ratio 1.7, seventh flagellomere composed of fused 7+8; scape and pedicel with short dark hairs; palpi with ratio of segments 15:17, second segment moderately clavate with dark velvety vestiture, both segments with pale pilosity; proboscis brownish yellow. Thorax with postpronotal lobes and postalar calli yellowish brown, some pleural areas somewhat brownish (especially propleuron and anepimeron), katepimeron dull yellowish; scutum mostly whitish gray tomentose except for presutural lateral margins and a narrow wedge anterior to scutellum, the tomentum evenly distributed except slightly denser along two faint discal vittae; scutellum tomentose except along margin; pleura tomentose except for propleuron, anepisternum except for extreme ventral margin, anterior two-thirds of katepisternum, and most of anepimeron bare and shiny; scutum and scutellum with short, inconspicuous hairs, mostly pale; tomentose areas of pleura pale pilose except posterior portion of katepisternum, entire meron, and central portion of mediotergite without hairs; coxae brownish, evenly set with whitish tomentum, pale pilosity present on anterior surfaces, short and sparse on posterior coxa; hind coxa without anterior tubercle; front and mid femora dark brownish, extreme

ends yellowish, hind femur yellowish at base, grading to brownish near middle becoming dark brownish apically; front and mid tibiae narrowly yellowish basally (especially ventrally), remainder dark brown, hind tibia yellowish, dorsal surface more brownish, apex dark brown; all tarsi with first and second segments yellowish, vaguely darkened at apices, third segments with basal halves yellowish, apically brownish, fourth and fifth tarsomeres dark brownish; legs with uniformly short, inconspicuous, mostly pale pilosity; wing with basal region narrow, alula extremely narrow, linear, narrower than width of base of vein A_1 ; wing primarily clear, pterostigma dark brown, cell r_1 brownish beyond origin of vein R_{2+3} , and slight brownish infuscation present near r-m and base of discal cell; halter with stem brownish, knob whitish with a brown spot near base on ventral side. Abdomen slender, with very narrow lateral and posterior margins of tergites and posterior margins of sternites dirty yellow, tergites with sparse grayish tomentum dorsally, becoming somewhat narrowed posteriorly on tergites 2, 3, and 4 so that margins appear quite shiny; sternites primarily without tomentum, but 5, 6, and 7 with sparse tomentum; entire abdomen with short, sparse yellowish hairs, segment one with longer, more whitish hairs. Male terminalia with epandrium (Fig. 3) simple, posterior margin evenly rounded, extending over posterior segments and most of cerci; ventral component of hypopygium as in Fig. 4, similar to other congeners, ejaculatory apodeme (endophallus of Webb 1979) with anterior margin truncate in dorsal view. Length 9.3 mm.

Female: Unknown.

Etymology.—The specific epithet is a noun in apposition, based on the Mexican state in which the type locality is located.

Remarks.—Male terminalia have not been utilized extensively in characterizing the species of *Xylophagus*. The differences between species are subtle compared to those found in many other Diptera. Hennig (1976:



Figs. 1-4. Features of *Xylophagus durango*. 1, head of holotype male, left lateral view. 2, anterior view showing distribution of tomentum, antennae removed. 3, epandrium and proctiger, dorsal view. 4, hypopygium, dorsal view (epandrium and proctiger removed). Abbreviations: *cer*, cercus; *ea*, ejaculatory apodeme; *hyp*, hypoproct; *sps*, sperm sac; *subs*, subepandrial sclerite.

Figs. 45-46) provided very useful illustrations showing the complex structures of the aedeagus and associated parameral sheath for *X. ater* Meigen. The spatial relationships are the same in other species I have examined.

I made an attempt to determine the cla-

distic relationships between *X. durango* and other members of *Xylophagus*, hoping to utilize the only published phylogeny (Webb 1979) as a basis. Webb's work was based primarily on Nearctic species, with only selected Palaearctic species included. I found it difficult to score some of the characters

utilized by Webb to construct his cladogram in *X. durango*, especially as all of the characters were not outlined in his list. A critique of his work is provided below, as it was found to be inadequate as a basis with which to deal with additional species of *Xylophagus* in a cladistic context.

Webb (1979) presented a "phylogenetic diagram" (1979: Fig. 1) for the Nearctic species of *Xylophagus* as well as 5 Palearctic species for which he had material. He provided a list of 12 characters with their proposed plesiomorphic and apomorphic states, but the figured tree, which had the apomorphic states indicated at their supposed origins, contained 15 characters.

Upon examination of all the species seen by Webb, I believe that some of the characters he utilized are trivial, particularly characters 5 (general pilosity of mesothorax) and 9 (position of end of vein R_5 at the wing margin) which show very little difference between states. I cannot see any difference between the genae of males and females of *X. cinctus*, which are coded as different (characters 11, 12; I have not seen males of *X. fulgidus* Webb, which was coded similarly). Despite this implied sexual dimorphism, no mention is made of the genae in the descriptions of the females of *X. cinctus* and *X. fulgidus*. For character 3, it appears that the polarity of the states should be reversed in Webb's list, since those species with a long antennal scape are treated as apomorphic for character 3 on Webb's tree (*X. fulgidus*, *X. ater*, *X. decorus* Williston, and *X. reflectens* Walker). Additionally, this character has been miscoded for *X. matsumurai* Miyatake on Webb's tree, as it also has a long antennal scape [it is stated to be very similar to *X. reflectens* by Webb (1979: 514); I examined *X. matsumurai* to confirm this feature].

Webb determined his character state polarities by "comparing the situation in more primitive Diptera and Mecoptera" (1979: 490). I feel that a more rigorous outgroup analysis is required to validate these polar-

ity decisions. Certainly the Mecoptera are a poor choice for this analysis, as this order may not even be the sister group to the Diptera as a whole (Wood and Borkent 1989).

Based on the character distributions on Webb's Fig. 1, I put the data in matrix form and reanalyzed it using Hennig86 (Farris 1988). No attempt was made to reevaluate or otherwise recode the character data. The tree was rooted by including a hypothetical outgroup taxon with all characters coded as plesiomorphic. Analysis by the implicit enumeration algorithm resulted in a single tree (Fig. 5). This tree (length = 25, ci = 60, ri = 79) was considerably different from that presented by Webb, which was purported to be that with "the least number of convergent origins of the apomorphic alternatives" (1979: 490). I rearranged the topology of the Hennig86 tree using the *Dos Equis* feature of the program to obtain Webb's tree. This was then diagnosed and found to be 10 steps longer than the actual shortest tree (length = 35, ci = 42, ri = 59). Clearly, a 10 step difference between these trees indicates that there are many that are shorter than that given by Webb. It should be emphasized here that I do not believe either tree accurately reflects the actual evolutionary history of *Xylophagus*, but the tree I obtained by Hennig86 analysis is the most parsimonious one based on Webb's character data.

Webb recognized the subgenera *Xylophagus* sen. str. and *Archimyia* Enderlein solely on the basis of the elongated antennal scape (1979: 498, 512; his character 3). Other recent authors have discounted the proposed subgenera (Nagatomi and Saigusa 1969, Krivosheina and Mamaev 1972, 1988). I feel that the length of the antennal scape is not discretely divisible when all species of *Xylophagus* are considered. If one accepts Webb's character data, but recodes *X. matsumurai* as having a long antennal scape (see above), the tree topology in Fig. 5 does not change, merely the tree statistics (length = 26, ci = 57, ri = 78). The character diagnosis

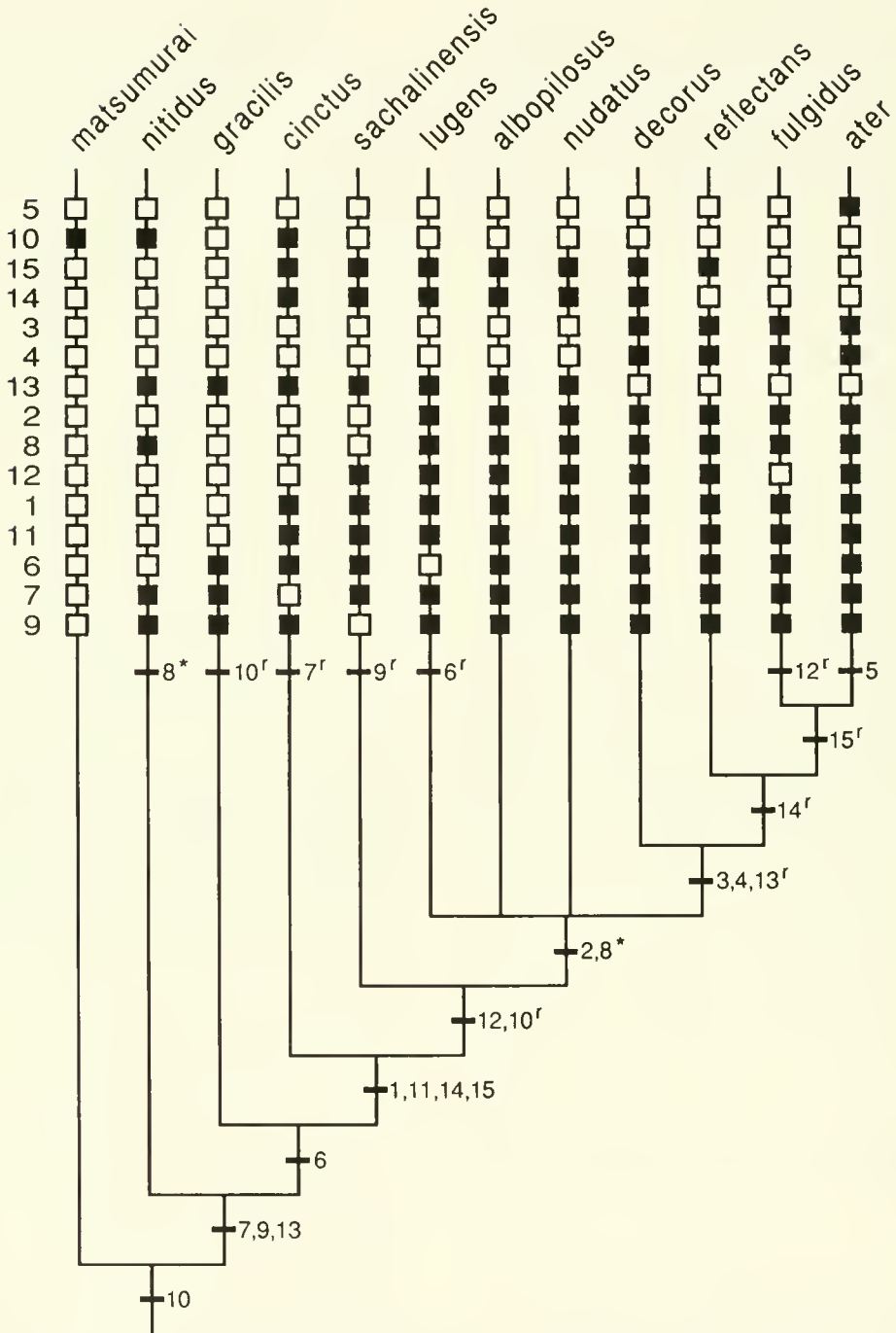


Fig. 5. Shortest cladogram obtained from data of Webb (1979). Open squares indicate plesiomorphic character states, closed squares apomorphic states. Superscript "r" indicates reversal back to plesiomorphic state, "*" indicates independent origins of character states. Character numbers are those used by Webb (1979: Fig. 1).

of this tree indicates that the elongate scape evolved independently in *X. mastumurai* and *X. decorus* + *X. reflectens* + *X. fulgidus* + *X. ater*. Clearly, acceptance of subgenera in *Xylophagus* based on this antennal character is unwarranted. On a more pragmatic level, in a genus with such a small number of species that are very similar in general appearance, recognition of subgenera would seem merely to make the generic nomenclature more burdensome.

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